Happiness & urban environmental quality

George MacKerron
Geography & Environment

personal.lse.ac.uk/mackerro/

Research question

Do levels of environmental quality (EQ) affect Londoners' happiness?

If so, how much do they? And what's the (implicit) cost?

Novelty

A new microeconomic data set was collected for this study, including detailed happiness items and each respondent's precise residential location to within a few metres.

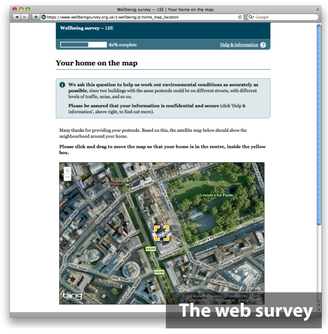
GIS was used to associate respondents' locations with EQ at **much higher spatial resolution** than previously attempted.

And **multiple EQ parameters** were considered, alongside additional spatial parameters, reducing the problem of omitted spatial covariates.

A spatial smoothing estimator, latent class regression, and an intermediate variables approach to characterising experienced EQ were also employed.

Methods

One thousand Londoners— representative by gender, age, and income brackets, and by residence in inner vs. outer London— filled out a web-based survey.



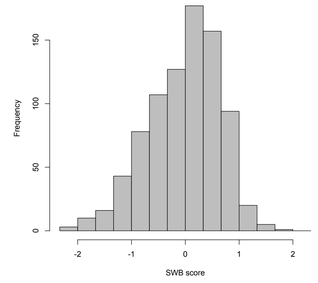
The web survey

An advanced web surveying framework, *websperiment*, was developed for this purpose, which enabled the use of interactive, map-based location questions.

websperiment

Measuring happiness

Happiness was measured with a standardised aggregate score of 30 **self-reported wellbeing** questions taken from the latest European Social Survey round.



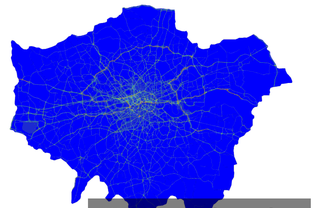
For example:

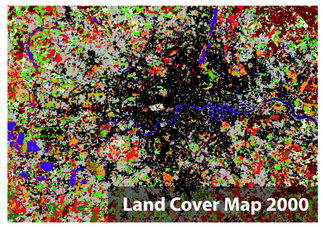
"All things considered, how satisfied are you with your life as a whole nowadays?"
0 (extremely satisfied) – 10 (extremely dissatisfied)

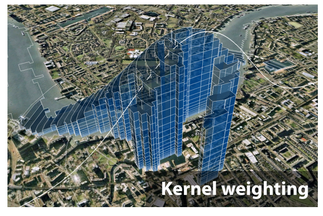
Measuring EQ

EQ levels were measured by taking very detailed spatial data on…

- **Air quality (PM10 exceedence days)** GLA LAEI 2006 (20m cells)
- **Green space** Landcover Map 2000 (25m cells), OpenStreetMap (vector)
- **Traffic noise** Defra (10m cells)
- **Aircraft noise** DfT (contours)
- **Crime rate** Met police (by sub-ward)


PM10 exceedence days


Land Cover Map 2000


Kernel weighting

…and using GIS (Geographical Information System) software to calculate levels for the precise location of each respondent's home and workplace (either point-based values, or kernel-weighted averages).

Controlling for other factors

All the major factors that have been significant in previous happiness research, and some others, were controlled for, including age, gender, marital status, work status, income, home ownership, education, housing quality and land values.

Key findings

From a simple ordinary least squares regression (OLS), **air quality had a significant effect on respondents' happiness,** both before and after controlling for other things**.** One additional day per year on which PM10 levels exceed the EU legal limit reduced happiness by 0.03 z-scores.

This size of this effect appears equivalent to the loss of about £5,000 per year. This seems rather high, although large monetary estimates for intangibles seem relatively common in the happiness economics literature.

A spatial smoothing estimator, latent class regression models estimated, and a model substituting intermediate experienced EQ variables for the EQ measures all gave qualitatively indistinguishable results from the basic OLS.

	Coefficient
airnoise	0.069
roadnoise	0.0081
pm10	–0.028*
green1km	–0.0034
crimevap	0.00015
ln(landvalue)	–0.083
cbdkm	–0.0061
homeowned	0.23***
soctenant	–0.013
housingproblems	–0.14***
peopleperroom	–0.0077
male	0.074+
age	–0.026**
agesq	0.00027**
ln(income)	0.13***
degree	0.072
unemployed	–0.19*
single	–0.14**
divsep	0.013
childlt5	0.14+
natparents	0.12*
religious	0.14**
fruitveg	0.073***
Constant	0.23
Observations	795
Adjusted R^2	20.3%

*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.1

OLS results

Next: an ESM study with iPhones

Beeping people to ask a momentary wellbeing question at random intervals, while collecting GPS location data.

mappiness.org.uk